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INDIAN JOURNAL OF PSYCHOLOGY

Mental Hygiene*

BY

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LADIES & GENTLEMEN,

I stand before you this afternoon to deliver my Presidential address with no mixed emotions. My emotions are simple and easily comprehensible. First, I am deeply sensible to the honour you conferred on me in electing me your President. I regard your choice of a psychiatrist as evidence of the catholicity of the interests of the Psychological section of the Science Congress; for hitherto the post of President has been filled by an academic psychologist. I am further sensible to the fact that I am the first European to preside over the deliberations of this section and I regard this second departure from precedent as an indication that racial feeling can find no expression in an assembly whose sole concern is the maintenance of scientific tradition.

While searching in my mind during the past few months for subjects that seemed important for discussion in this address, many things crowded into the focus of my attention. I realised that while I must rely mainly upon psychiatry for the subject matter of my address, I must at the same time keep well in mind the obligation to acknowledge the great debt that psychiatry owes to workers in other fields of mental functioning. Psychology has now come to denote more than that "science of mind" which began with theory and ended

* Presidential Address—Indian Science Congress, Section of Psychology, 1927.

where it began—a subject of no practical utility, existing wearily in schools and universities and dead to the pulsating life outside. Psychology is now a living science whose concern is the internal as well as the external phenomena of mental life. Its dynamic aspects render it of practical value in many directions. From all sides calls for help reach this dynamic psychology, as the medical man, the lawyer, the minister of religion, the educationalist and the social worker begin to realise its numerous practical applications. In these circumstances the subject that I have selected to discuss, namely, Mental Hygiene, is one which appeal: to me as being of significance upon this occasion. Whether my choice has been a wise one I leave you to decide.

I think that most of us will agree that the last thirty-five years will be looked back upon in time to come as covering a period of psychological devolopment that has no parallel in previous history. It was Emil Kraepelin, (whose comparatively recent death has deprived us of the honour of welcoming him here to-day) who made it possible for the first time to employ experimental psychology to explain mental disorder in terms of psychological processes so that the path that modern psychiatry now treads may be said to have been paved by Emil Kraepelin. Later as the 19th century merged into the 20th, there arose in Vienna, another giant pioneer, namely, Sigmund Freud. The work of Freud gave us for the first time a grasp of the biological significance of the psyche as well as of the fundamental way in which it works. Psychoanalysis has now gone far beyond its first beginnings so that to-day it stands for a conceptual method of approach to any and every variety of mental disorder. The mechanisms of repression, condensation, identification and projection, and the concepts of ambivalence, the unconscious, archaic reactions and paleopsychology are of profound significance and importance for psychology. The advent of psycho-analysis directed our attention for the first time to where the real

trouble has taken place and centered our interest upon the actual mechanisms that are producing the symptoms. The result of all this is that present-day psychology covers, not one, but a number of activities all of which are dedicated to the pursuit of one purpose, namely, to help mankind to a better, a fuller and a happier life. One product of this purpose has been the introduction into popular currency of the term "Mental Hygiene" and with it a broadening of the conception of public health to the end that already in many countries the cultivation of mental health is as much the concern of the department of Public Health as is the cultivation of physical health. In India however no such advance has as yet taken place. We may presume that the advantages that would accrue upon such an outlook on communal welfare, have so far escaped the notice of our legislators. It is therefore my intention to devote the principal part of my address to placing before you some specific recommendations towards bringing about better co-operation between psychologists and psycho-pathologists for the establishment of a properly organised movement for the promotion of mental hygiene in this country. The general objects of such an association should be as follows : To work for the protection of the mental health of the community ; to help in the prevention of nervous and mental disorders and mental defects ; to help in raising the standards of care and treatment of those suffering from mental deficiency ; to promote the study of these subjects in all their form and relations and to disseminate knowledge concerning their causes, treatment and prevention ; to obtain from within India as well as from elsewhere reliable information regarding the conditions and methods of dealing with mental disorders and mental deficiency ; to co-operate in accordance with the policy of the association with the various departments and other existing agencies concerned with these problems. I will now attempt to outline what might be a modest programme of work along these lines and in so doing

I propose to follow more or less, certain suggestions of Prof. Morris Miller, Director of the Psychological Clinic of Hobart, Tasmania. As Professor Morris Miller has insisted, we should first endeavour to establish the term "Mental Hygiene" in daily use. Mental Hygiene is an euphonious term and pleasing to the ear. It is free from unfortunate associations; it has a positive aspect and carries with it something of hope. It has already gained world-wide recognition, and stands for something definite in the regions of health. Dr. Lewellyn F. Barker, sometime President of the United States National Committee, has well described the campaign for mental hygiene as a "continuous effort directed towards conserving and improving the minds of people.....a systematic attempt to secure human brains so naturally endowed and so nurtured that people will feel better, think better and act better than they do now."

We have long been accustomed to the idea of getting and keeping oneself physically fit to meet the tasks of life; we need to reinforce that effort with the idea of getting and keeping oneself mentally fit. By all means let us develop sound bodies through which sound minds may function well, but let us also see to it that we develop sound minds that will function through sound bodies, and keep them so.

We have too long been satisfied with casualty work, redeeming the past of those who have gone down in the struggle. Now we are somewhat awake to the fact that we must needs prepare ourselves beforehand to meet the evils of the mind and fight a way through them to positive achievements. The foundations for strength of mind, as well as for strength of body, must be laid and that too, well and deeply laid-in childhood. And so we come back to the everlasting demand of the ages, more adequate educatioual methods and more efficient educational service to develop more robust individuals for social service.

Many go even further and insist that we must of necessity consider the original endowments of human beings that are

to be trained for life and for the passing on of life. We require better types of individuals and the preservation of existing types that meet the demands of the times. Accordingly, we must not merely salvage the wreckages, we must prevent their occurrence : and so push on toward social efficiency that we shall have to spend less time on redemptive work and more time on creative work—thus enlarging the scope of human service and giving it a place of stability on the heights of progress

But truly we have a long way to go, and we have been an unconscionably long time in getting where we are to-day. Still we must go on. Though it is indeed something gained to have a good name for a good cause, yet it is better far to get into action for the cause itself. Having sounded forth a new name, we must not be blind to the fact that it still leaves the old sores very much where they were, unless we can forget the things that are behind and go forth under the banner of a new movement with an enlarged hope.

Because mental hygiene problems go beyond what is purely medical and involve questions relating to social, educational and industrial conditions, it is imperative that if we are to advance in the attack against ideas and things that endanger the mental health of the community, we must bring together the specialists in medicine, education and social service into a common organisation. Team work is essential to success in these efforts as in so many others but the lead should lie with the members of our Association. By means of it the various outside interests in mental hygiene will be co-ordinated and apportioned values in accordance with their relation to the movement as a whole. At present this is distinctly lacking with the result that some push for the complete recognition of the claims of the feeble-minded ; others work in the field of delinquency ; others are concerned with pressing local Governments for more money for better treatment of patients in mental hospitals ; others again plead

for the special education of the super-normal child in the schools, and so forth. These fields of service are all separated from one another and are regarded as being apart, especially when funds are being demanded of Governments. What is urgently needed is a means of inter-adjusting their claims and giving them all their due status in a complete State programme of mental hygiene. This task of co-ordination and appraisal of sectional interests will be a first demand upon the organisers of a mental hygiene movement in this country. The difficulties that will have to be faced are of no mean order. I can do no more than merely touch upon them but in so doing I ask your indulgence to speak plainly.

As far as psychiatry is concerned, it is quite fair to say that outside the walls of Mental Hospitals the subject is almost totally neglected in India. Outside the hospitals skilled psychiatrists are extremely few in number. In many of the largest towns in this country there is not a single specially qualified physician to whom a mental case can be referred for advice and treatment. As far as I am aware this is true of the wealthiest cities in India—Calcutta, Bombay and Karachi. What makes this fact the more deplorable is that the medical profession and the general public appear to accept this situation as being in the nature of things for there is no sign at present of any effort to correct it. Presumably the medical and the general public consider special knowledge and skill to be indispensable to the proper management of a Mental Hospital, but there is no evidence that they hold this view in respect to the treatment of the individual before his admission into a Mental Hospital nor after his discharge therefrom. Even the discharge of a proportion of the patients admitted into the hospitals, when cured or improved, has failed to convince either the public or the medical profession of the possibilities attendant upon the application of proper treatment in the early stages of mental disorder. There is still the view that the study and practice of psychiatry

can be of service only in the treatment of hopeless conditions. Now this attitude of mind on the part of the public forms a very serious obstacle to any attempt to get going a mental hygiene movement. Hence to correct public opinion on this point should be one of our principle objects. Experience in other countries has shewn that most effective measure to this end is the establishment, wherever possible, of out-patient clinics. The existence of such clinics brings the psychiatrist into touch with the general medical practitioners in a way that is mutually helpful. The latter get the opportunity to see the psychiatrist at work on cases with which the practitioner is familiar, and any help given tends to increase their interest in and respect for psychiatry. Then the educational value of such clinics may be advanced further by talks to school teachers and parents whose pupils or children have been examined at the clinic. Activities of this sort not only bring relief to sufferers but help to create among the public a feeling of confidence in psychiatry. The next move must be in the direction of starting a psychopathic ward in every hospital which is a teaching centre throughout India. But to bring this state of things into existence, more men are needed. Hence I suggest for the consideration of those who are responsible for such matters, the creation of an alienist or psychiatrical department. This department may be an Imperial one or a Provincial one. On the whole I favour development along provincial lines because, as far as my very limited knowledge goes, there is no rivalry at present between the various provinces in India to have the best Public Health Department. There certainly should be, and perhaps the introduction of this new branch of public health, the psychological branch, might give rise to it. From the very start we should insist that candidates for the psychiatrical cadre of the public health service, should have the best training that their local Governments, or the Imperial Government, as the case may be, can give them.

That is to say, they must not get their training necessarily in the province to which they belong by birth in order to gratify local snobbery. The subject is too important and too pregnant with possibilities of future development to be left to the tender mercies of the parish pump. If, later on, it is found that the facilities in India for an adequate training of these men, (and possibly women too), are not available, they must be sent abroad, either to Europe or to America. Nevertheless, until this proves to be the case, let us make a beginning with what is now at our disposal. Let us find out where are the best teachers for the subjects which have to be taught, and send pupils to them. In a few years each important centre in India will have a few trained psychiatrists who can at least begin to train the next generation.

Besides their ordinary work in connection with the psychopathic ward which would, of course, include regular instruction to medical students, our psychiatrists would organise the spread of psychiatric knowledge among the more cultured population of the great towns. By working in co-operation with the local magistrates, they would be in a position to aid materially in the application of proper judicial treatment to mentally deficient offenders against the law. To the jail and to the Educational Departments the psychatric staff wonld be able to afford much of that help which both departments so urgently need.

The penologists in this country, (and here I include barristers and pleaders along with judges and magistrates), are still very far from the realisation that the criminal is the State's greatest crime. Crime is not a detached or separable fact, self-contained and self-subsisting. It is only a symptom. It is a mental symptom with a mental origin. The study of the criminal has become a distinct department of psychology and the handling of the juvenile offender is, or should be, a practical application of known psychological principles. As Professor Cyril Burt has pointed out, with moral disorders as

with physical, we must find and fight not symptoms but causes. To whip a boy, to fine him, to shut him up in a penal institution, because he has infringed the law, is like sending a patient, on the first appearance of fever, out under the open sky to cool his skin and save others from the infection. It is as blind and unintelligent as the primitive treatment of malaria when the parasite was unlooked for and the mosquito ignored. Our judiciary, our lawyers and our police have got to learn that the more intelligent section of their community has already realised that the treatment of crime does not so much rest with the investigation of the offence as with the investigation of the offender. Nowhere in India, as far as I am aware, is any attempt being made to do this. Our law-courts, our jails and our so-called reformatories continue as divorced from that definite body of ascertained psychological knowledge as they were fifty years and more ago. What is worse is that they appear content to remain so.

If the community of this country ever becomes sufficiently enlightened to provide justice for the poor, I think that they will probably adopt the American example of what are called Courts of Domestic Relations. Judge Lindsey of Denver, Colorado, testifies as follows :

" I am judge at this time of what is known as a separate, special Court, in a city of nearly 3,00,000 people.....this Court has jurisdiction over all children cases, and all youths under twenty-one, all cases of non-support or desertion of wives or children, and of all controversies of parents over their children, and practically all criminal cases where the accused has committed an offence against a child. Thus, it is a special tribunal for the correction and protection of children and some cases of domestic relations.....We have visitation and probation officers, medical clinics, physical and psychological, which aid and assist us. The work of this Court, in a word, is that of a piece of human adjustment..... The budget of this Court for all its work in its various

divisions, last year, was about $30,000. I believe with you that would be about Rs. 78,000. This includes the salaries of the judge, the clerks, probation officers, stenographers, visitation agents, specialists, etc. We heard and disposed of about 3,000 cases last year at an expense of about $10 per case. When we have to send a youth to the State prison, jail or reformatory, we send him by himself on trust and honour, without an officer and without official restraint. Out of some eight hundred thus committed in the last twenty years, we have never lost a prisoner.....We very seldom swear a witness in the Court, and seldom take testimony... We have no rules of evidence and no Court costs, and, as a rule, no lawyers or counsel or solicitor's fees. The judge of this Court is a human adjuster of human difficulties without cost or expense to the parties involved." Another American Judge writes as follows : " The Juvenile Court Procedure has all but disappeared. We do not believe that a court Procedure has any therapeutic value in the handling of children afflicted with that which we term the disease of delinquency. It has been found possible for us to prevent the sending of children to the industrial schools, reformatories, or correctional institutes of any character.. In this State we have an Industrial school that has accommodation for 1,200 boys. Cincinatti has a population of 5,00,000 and is the second largest city in the State. Notwithstanding this fact we have but two boys in the Industrial school at this time and these two have been committed to that institution only because we have found them to be incurable and there is no other institution in the State that is equipped to handle cases of this kind. We hope to remedy this defect at an early date. We have sent no girls to the State Industrial school for the last three years."

Our clinics therefore should also be centres for research and possess laboratories and equipment sufficient for carrying out these functions. The personnel of the mental hospitals and psychiatric clinics would require reinforcement by means

of a psychiatric social service. The social service worker should, of course, act under the direction of the psychiatrist. In India we are fortunate in the possession of many mission societies as well as a variety of social service organisations, from whom valuable assistance could be expected. Indeed, help from social service workers is being found in countries where mental hygiene organisations exist, to be almost indispensable not only for complete diagnosis and treatment, but also for after-care supervision, both in the family and in the vocational activity of the patient. Through the agency of the social worker the staff of the hospital or clinic are enabled to get a living picture of the patient's social surroundings, and to carry on remediable measures beyond the confines of the institution. I will now pass to a short consideration of the question of the protection, care and treatment of mental defectives. Here I may refer by way of a preliminary observation to the lamentable lack of provision for the feeble-minded throughout India. Individuals are being aroused everywhere to the appalling need for collective action, but up to the present this unfortunate class remains practically uncared for as far as legislation is concerned. In 1925, the Hon'ble Mr. Haroon Jaffer moved the Council of State to recommend to the Governor General in Council that the Provincial Governments be asked to investigate the best means of dealing quickly and adequately with cases of mental defectives. A discussion followed which was remarkable only for the ignorance of the subject displayed by all who took part in it. The motion was eventually withdrawn. We must therefore instruct our legislators in the nature and the scope of the problem and impress on them that permanent results are not likely to be achieved without legal sanction to enforce treatment and care. To this end India must have a Mental Defectives Act. The next step to take should be a survey of each province as a whole as far as is practically possible. Schools, charitable institutions, child

welfare societies, benevolent organisations, departments controlling the children of the State and the protection of infant life, and similar bodies, may all assist the survey by reporting or notifying suspected cases for examination. This latter method of notification, both before and after examination, is a very effective means for controlling the movements of mental defectives, especially the feeble-minded grade, before they finally leave the schools. In this way the central authority is kept in direct touch with all defectives attending schools and it is enabled to put into immediate operation legal methods for their guidance and protection in after life. In all the large cities throughout India it should not be difficult to institute special classes or special schools for the feeble-minded wherein each child receives a due amount of individual instruction to enable him to develop up to the limits of his mentality. A distinctive feature of these classes should be what is termed the sensori-motor training, which is mainly prevocational in character. Some of the children attending these classes may, under specialised instruction, go out into the community and earn a fair livelihood under favourable conditions. The greater number will require supervision in after life while some will ultimately reach a custodial institution or training school. Besides the provision of special classes or schools for the feeble-minded, it is necessary to organise proper supervision over them. It is obvious that no province could possibly provide beds in institutions for the whole of its mentally-defective population, so we may take comfort from the knowledge that a large number of mental defectives, especially the high grade feeble-minded, may and do live well in the community under adequate supervision, when this supervision is carried out by trained social workers or by enlightened voluntary committees formed for the purpose. Wise and tactful administration on the part of supervisiory officers can confer lasting benefits upon individuals, so that the State ultimately gains in social efficiency.

Further it will be found possible to place certain cases under the guardianship of competent persons who are capable of appreciating the limited intelligence and the nature of reaction of their wards. Lastly, comes the creation of institutions for the permanent care of certain types of feeble-minded. Such institutions should be in the best sense training schools, and by proper classifications and distribution of their population the inmates may by their services contribute in part to their support. Life in an institution may be made a very happy one; everything is provided that is necessary for the child's good, and however old they grow, they are never burdened with the care and responsibility of normal individuals.

The examination of the feeble-minded should be thorough and systematic. It should include a survey for identification and registration and should be carried out by a psychological or psycho-educational clinic on whose staff there should be psychiatrists, psychologists, social service workers and clerks in proportion to the demands made upon it. The examination of each child should include four main fields of enquiry, medical, social, pedagogical and psychological. The final determination should be a correlation of the results of the investigations made in all these fields of enquiry. The examination should be made in the interests of the child, with a view to determining the nature of his mentality and the kind and method of instruction and training that are best suited to his mental and physical conditions.

It will be part of the business of these psycho-educational clinics to assist in the training of special class teachers and others engaged in the instruction, protection and supervision of the mentally-defective and it is here where so much help may be expected from the experimental psychologists.

While I have had in mind throughout this brief review some of the measures needful for those suffering from mental disorders and mental deficiency, I must not omit to remind you that the normal individual, whether adult or child,

requires his due need of consideration. I will however leave to abler workers than myself the problem of advocating the association of mental hygiene with the life of our schools, colleges and universities.

Most of us will agree with the opinion of Thomas Henry Huxley that the theory of evolution encourages no millennial anticipations, but, as Huxley said in his famous Romanes lecture on Evolution and Ethics, there is no limit to which intelligence and will, guided by sound principles of investigation, and organised in common effort, may help to change the nature of man himself. Any how, it is an essential condition of any realisation of whatever hope we permit ourselves to entertain of an abatement of the evil of the world, that we should cast aside the notion that the escape from pain and sorrow is the proper object of life. As Huxley said, we have long since emerged from the heroic childhood of our race, when good and evil could be met with the same 'frolic welcome,' the attempts to escape from evil, whether Indian or Greek, have ended in flight from the battle-field; it remains to us to throw aside the youthful over-confidence and the no less youthful discouragement of nonage. We are grown men, and must play the man,

"* * * strong in will
To strive, to seek, to find, and not to yield,"

cherishing the good that falls in our way, and bearing the evil, in and around us, with stout hearts set on diminishing it. So far, we may all strive in one faith towards one hope:

"It may be that the gulfs will wash us down,
It may be we shall touch the Happy Isles,
.....but something ere the end,
Some work of noble note may yet be done."

A Report on Some Experiments on the Indirect Perception of Forms

BY

SUHRITCHANDRA MITRA

The importance of the function of Indirect Vision for our daily life can hardly be exaggerated. To take only one instance out of many, how many people realise that the many voluntary and involuntary changes in the speed and direction of the movements which they make when crossing the busy thoroughfares of the town, are guided and controlled to a great extent by what they only indirectly perceive? For this reason, as also for any attempt at a satisfactory explanation of the intricate mechanisms and complicated functions of the organ of vision, an investigation into the problems of Indirect Vision is of utmost necessity. I have elsewhere attempted to indicate some of the more important problems in this field. The experiment here described concerns itself with an aspect of the problem of the perception of forms in indirect vision. The questions that I set myself to answer were whether any change takes place in the perception of lines and curves—which are the simplest of forms—in direct and in indirect vision, and if so, whether there is any correlation between the nature of the lines and the distance at which such changes occur. There were thus two questions, the first a qualitative one, and the second a quantitative.

Before describing my own experiments I would like to refer to an experiment described by Sanford in his Experimental Psychology (Exp. No. 172 a, p. 189). He says that if leaning over a table and fixating a point on a large white paper spread on it an attempt be made to arrange three buttons or bits of paper in a straight line, parallel to the median plane,

a foot or two away from the fixation mark, the result is a curve convex towards the fixation point. From this he concludes, "that if lines convex toward the fixation point appear straight, lines that are actually straight should appear concave." Our results however have not borne out this latter expectation of Sanford. With every observer a straight line of whatever length it might be always retained its character irrespective of the part of the retina which received its image. Moreover, as lines which were concave towards the fixation point also appeared straight, I do not think that there is any logical ground for expecting that "lines that are actually straight should appear *concave*" only in indirect vision.

As a preliminary experiment I made tests with pins and bits of paper as described by Sanford. I also asked my subjects to dot three points in a straight line on the black board while fixating on a given point. The results were exactly as described by Sanford. I proceeded then to make systematic experiments.

In a comparatively dark room of the Calcutta University Psychological Laboratory the subject was seated comfortably on a chair. On a table in front of him was attached a chinrest where he placed his chin during the course of the experiment. In order to prevent movements of his head its position was fixed by lightly clamping two vertical bars on its two sides. At a distance of 20 cms. from the chinrest a large screen of grey cardboard was placed. On the screen just at the level of the eyes of the subject was a black fixation mark on a white card which was pasted there. A paper scale was also pasted on the screen. White post cards with lines straight and of various degrees of curvature drawn on them in Chinese Ink were the only other materials used.

The subject placed his chin on the chinrest and closed his eyes. At a given signal he was to open either his right or his left eye or both eyes as he might be instructed and to fixate on the mark. He was on no account to allow his eyes to

wander anywhere outside the boundary of the fixation dot. He was to report whether he saw anything else in his field of vision, and if so, on what its nature was. He was told that he would be given straight lines and curved ones indiscriminately. He was asked to close his eyes every time after he has given his judgment. Sufficient time was given between every two experiments in order to prevent rapid fatigue of the organ and to eleminate the chance of the second result being vitiated by the persistence of the after-image of the first. The subjects were Research Scholars and advanced students of our department sufficiently trained in Psychological observations. Two of them wore spectacles but one observed without glasses.

As regards the qualitative problem the method I adopted was one of haphazard presentation. I exposed different cards in different regions and kept records of judgments. Straight lines were exposed in vertical, horizontal and slanting positions and so also were curved lines. Variation of judgments occurred only in cases of the latter, which were, at some positions, judged to be straight and in other curved. But curiously enough the straight lines were never misjudged. Both the eyes were separately investigated as also simultaneously. Sometimes the cards were exposed even in different planes. The one fact that came out from these experiments we have already reported. Having regard to the fact that the same curved lines somewhere appeared straight and elsewhere curved, I now proceeded to find out more accurately where exactly the change occurred. This brought me to the quantitative problem. For my first series of experiments in this direction, the report of which only I am submitting to-day, I decided only to explore the Right Horizontal Temporal Meridian of the field of vision, and chose only a limited number of curves. They were all parts of circles of radii, 4·3, 8·5, 9, 10·5, 11·5, 14, 15·5, 17·5, 18·5, and 19·5 cms. respectively.

The method of procedure varied only in this, that instead of haphazard presentation, I now proceeded step by step outwards and inwards and recorded changes of judgment. Taking the usual precautions of the Gradation Method, I got in every case the average and noted it. Each of the figures given below against a radius is an average of 4 results and indicates the position where the curve line, under the conditions of the experiment, begins to appear straight. In the tables A, B, C, D and E given below, the results of each subject are given, of which the averages are calculated in the last row. In table F, the average of all the results of the experiments is given. Whether this would be the ultimate type of all results of this nature, I leave future experiments ta decide. The values corresponding to the radius 15·5 have been rejected, as the line drawn on the card was unfortunately too faint to be experimented upon.

TABLE A.

Subject—M.S.

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	22	18	24	20	22	22	20	21	22	23
	24	19	20	21	21	20	21	21	22	21
	22	19	20	22	22	21	20	21	23	22
	23	19	21	22	22	21	19	22	21	24
	24	21	20	20	21	22	22	22	20	21
AVERAGE	23	19·2	21	21	21·6	21·2	20·4	21·4	21·6	22·2

TABLE B. *Subject—M.G.*

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	25	21	22	21	21	20	16	20	21	23
	27	20	21	25	21	20	20	26	21	25
	26	26	24	22	24	25	22	25	23	25
	23	20	19	19	21	23	14	20	20	20
AVERAGE	25·25	21·75	21·5	21·75	21·75	22	18	22·75	21·25	23·25

TABLE C. *Subject—S.S.*

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	14	11	12	13	13	13	12	16	15	15
	16	14	15	17	17	14	13	19	18	15
	15	13	15	15	17	16	14	18	18	17
	14	13	12	12	15	12	13	15	14	14
AVERAGE	14·75	12·75	13·5	14·25	15·5	13·75	13	17	16·25	15·25

TABLE D. *Subject—S.B.*

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	22	19	19	21	22	22	19	22	21	21
	23	21	22	20	20	23	19	23	22	23
	25	20	21	22	25	23	20	24	23	20
AVERAGE	23·3	20	20·6	21	22·3	22·6	19·3	23	22	21·3

TABLE E.

Subject—R.M.

CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
	27	18	21	24	26	25	23	28	25	25
	26	22	26	24	23	27	19	28	26	22
AVERAGE	26·5	20	23·5	24	24·5	26	21	28	25·5	23·5

TABLE—F.

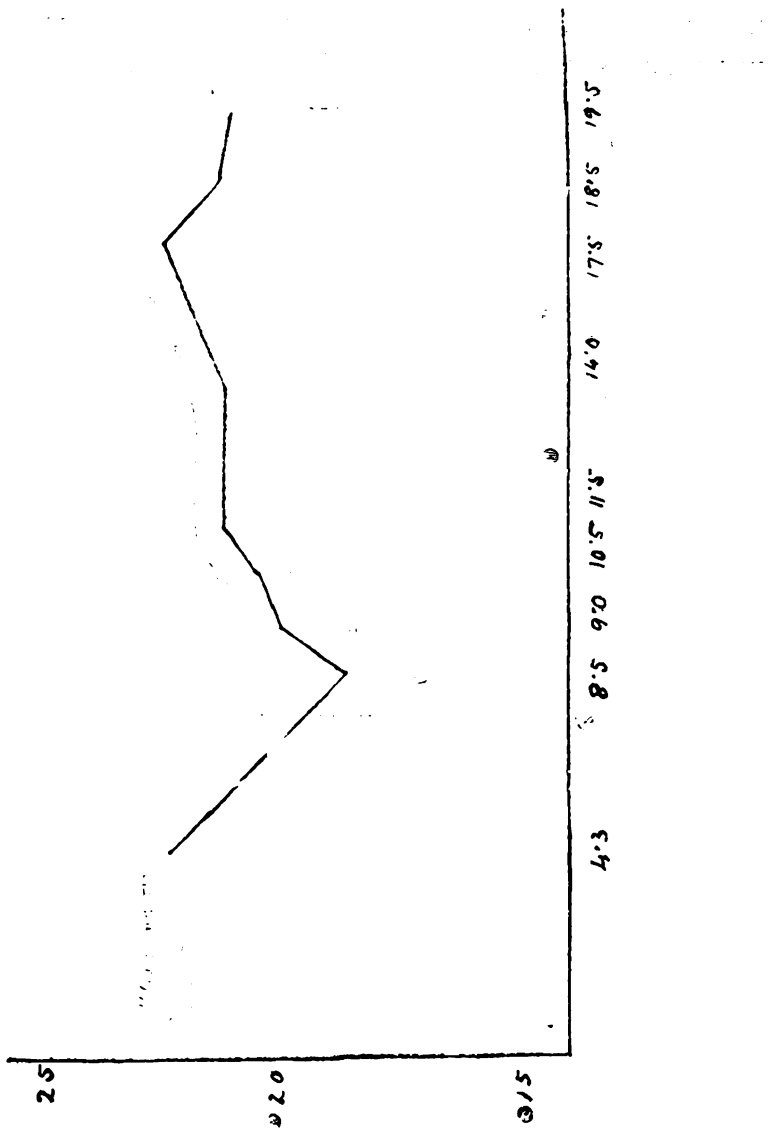
CURVATURE	4·3	8·5	9	10·5	11·5	14	15·5	17·5	18·5	19·5
AVERAGE	22·56	18·74	20·02	20·4	21·13	21·11	18·34	22·43	21·32	21·1

REMARKS.

I should like to remark at the outset that the results that we have achieved are admittedly few for any generalisation. Though a perusal of the tables indicates one or two general tendencies. I am not as yet sure whether these will persist and maintain their character when the experiments are continued long enough, and whether other characteristics will not emerge when different types of subjects are examined. Postponing therefore any explanation of the observed facts to a future occasion I shall now summarise the results thus far obtained.

The first drop, as we proceed from a radius of 4·3 to 8·5 is common to all the tables. In Table A if we neglect the slight discrepancy towards the region 11·5 we have a steady upward tendency after the first fall at 8·5. In Table B also there is some variation in the region 18·5, otherwise there is a continuous upward tendency of the curve after the initial fall. I do not offer any explanation for these variations.

They may be chance variations or there might be reasons which may emerge after a longer series of experiments. In Tables C, D, and E after the first drop, there is almost a steady rise, the maximum attained being in every case at the region of 17·5, after which there is a steady decline. In the final Table F, all the characteristics of the last three tables are maintained. I give here a graphic representation of the values in the Table F.



Besides these, other interesting phenomena have been gathered from the introspections of the subjects. I cite here one of them. Three observers reported that they sometimes saw double lines, either parallel or one straight and the other curve or sometimes in the form of a cross. That this is not due to any extraneous condition or to fatigue I have satisfied myself; but this being not my immediate problem, I did not sufficiently go into it. This phenomenon of double vision under conditions of monocular perception in persons with normal eyes would itself be an interesting study.

Monocular Perception of Distance

BY

N. N. SENGUPTA AND S. K. BOSE

The perception of distance is generally attributed to the function of two eyes working together. Monocular perceptton is said to be wanting in the quality of depth. The truth of this statement may be verified even in our every day life. The distance between two objects appears smaller when seen with one eye. In the same way if you place a number of objects on your table at varying distance from one another and try to reach them with your hand with one eye closed you will generally be in error in your estimation of distance. The experiments reported in the paper are intended to measure the amount of error in the perception of distance seen with one eye. The problem is an old one. Wundt performed a series of experiments in the same line. In his experiment the subject "looks at a black thread which can be moved nearer to or farther from a white screen, through an opening." The values given by Wundt however seem to be too large. The present series of experiments were undertaken with a view to verify, to check and if possible to arrive at a more accurate estimation of the errors involved in the monocular perception of distance.

Description of the apparatus :—

The apparatus used for this experiment is a simple device of our own. It has two parts. The main part consists of two vertical brass poles 4 c. m. apart and provided with two upright steel pins at their tops, on a flat rectangular base. One of the poles is permanently fixed, while the other is mounted on a long screw resting horizontally along the

length of the base, in such a way that by turning the screw head the pole may be freely moved forward and backward. To the base of this moving pole a pointer is attached which slides over a fixed scale graduated to $\frac{1}{32}$th of an inch. When the pointer is at 'zero' mark the two poles stand side by side in the same plane parallel to the edge of the base.

The second part consists of a chin-rest with an adjustable screen about 34 c. m. in front of it.

Procedure:—

The subject was seated with his chin placed comfortably on the chin-rest. The main piece was now placed in a line behind the chin-rest and the interposing screen was so adjusted that the subject while looking straight could see only about 2 c. m. of the two pins which were painted white in order they might be more visible. The distance between the eyes and the pins was about 46 c. m. A large grey screen was placed about a metre behind the apparatus to form the background, as it was found in the preliminary tests that the pins could be better seen with a background.

The subject sat with eyes closed. At a signal from the experimentor he opened his eyes and looked at the pins for about two seconds. He was asked to report if the pin heads were in the same plane or not. The threshold values were determined by the 'Method of Gradation.'

Six subjects, all students of Experimental Psychology, co-operated in the experiment. In any single series not more than three sets of experiments were performed. The readings were taken for two eyes, right eye and left eye of the subject. The first four subjects who all had defective eye-sight were each tested on four different days, one series of readings being taken on each day. The other two subjects who had healthy eyes were tested on two days, two series of readings being taken on each day for each subject. The records of these two subjects have been marked with asterisk in the tables.

The experiments were conducted in the college hours between eleven and four.

Readings obtained by varying the position of the movable pole over the half of the scale nearer to the subject have been classified under the head 'negative' while the readings over the other half of the scale farther from the subject, under the head 'positive.'

The introspection of the subjects shows that sometimes they compare the respective distances of the two pins either from the eyes or from the screen in the background. Thus the judgment of distance has sometimes been formed in relation to one or both of these points of reference.

Treatment of Results :—

It appears from Table 1 that the threshold value of distance when seen with one eye is from 5 to 8 times as large as when seen with two eyes. In other words if we take our normal binocular vision as the standard the error in monocular perception is from 5 to 8 times of the value.

TABLE I.

Average differential threshold value for each subject.

(The values are in terms of the unit *viz.*, $\frac{1}{32}''$)

Subject.	Both eyes.		Right eye.		Left eye.	
	Post.	Neg.	Post.	Neg.	Post.	Neg.
A.	2	2·1	17	16·6	17·5	15·9
B.	1·6	1·6	9·4	9·6	10·2	10·6
C.	2·2	1·9	17·9	15·4	16·6	16·2
D.	2·1	1·7	11·2	9·6	10·0	9·3
E. *	1·7	1·5	7·7	7·5	8·5	8·25
F. *	1·5	1·5	6·5	7·0	7·0	6·0

TABLE II.

Amount of individual deviations.

		Subj. A.	Subj. B.	Subj. C.	Subj. D.	Subj. E.*	Subj. F.*
Both eyes ...	Post. ...	·17	·23	·37	·27	·13	·33
	Neg. ...	·39	·11	·13	·01	·21	·21
Right eye ...	Post. ...	5·4	2·2	6·3	·4	3·9	5·1
	Neg. ...	5·7	1·3	4·5	1·3	3·4	3·9
Left eye ...	Post. ...	5·9	1·4	5·0	1·6	3·1	4·6
	Neg. ...	4·86	·44	5·16	1·74	2·79	5·04

It is also obvious that there is a large amount of individual variation in the monocular than in the binocular perception of distance. The values for binocular perception range between 2·2 and 1·5 of the unit ($\frac{1}{32}$) employed. Those for monocular vision range between 6·5 to 17·9 in the case for the right eye and 6 and 17·5 in the case of the left eye.

TABLE III.

M. V. for each subject's threshold value.

Subject.	Both eyes.		Right eye.		Left eye.	
	Post.	Neg.	Post.	Neg.	Post.	Neg.
A ...	·0	·07	1·1	1·5	1·1	1·1
B ...	·17	·17	·7	·9	1·2	1·2
C ...	·25	·17	·9	1·1	1·3	1·0
D ...	·17	·25	·05	1·3	·5	·6
E* ...	·25	0	·25	0	0	·25
F* ...	0	0	·7	1·1	0	·11

Further, the same individual gives a fairly constant estimation of distance in the course of the experiment. The m. v. values are very small in the case of binocular perception, in the case of monocular perception, too, they are not very large.

TABLE IV.

(Wundt's Table)

	Liminal Movement.	
Dist. of thread.	When moved forward.	When moved backward.
·5 Metre	4·5 cm.	6·5 cm.
·8 „	5·0 cm.	7·0 cm.
1·0 „	8·0 cm.	11·0 cm.

TABLE V.

(Sample of data from the present series of experiments.)

	SUBJECT. D.			
Distance from eye to pin.	Right eye.		Left eye.	
	Positive.	Negative.	Positive.	Negative.
46 cm.	·9 cm.	·74 cm.	·76 cm.	·72 cm.
77 „	1·83 „	1·7 „	2·18 „	2·18 „
108 „	2·4 „	2·2 „	3·0 „	2·6 „

It is interesting to note that the threshold values obtained by Wundt are very much larger than in the present series of experiments. (Tables IV and V). This may be due to the fact that the threads in Wundt's apparatus are seen through a slit.

The distance of the apparatus from the eyes of the observer has been kept constant in the present series of experiments. The difference in the threshold values, when this distance is varied, is an interesting problem and is now under investigation.

A Few Thoughts on the Organisation of a School

BY

GURUBANDHU BHATTACHARYYA

The organisation of a school refers to arrangements to ensure its effective working. The arrangements relate to (1) School house and its site, (2) class rooms on hygienic principles to secure favourable physical condition, (3) equipment with suitable furniture to secure desirable material condition, (4) selection and appointment of teachers, (5) admission of pupils and administrative activities which imply

(*a*) Office records
(*b*) Supervision of teaching
and (*c*) Discipline.

I propose in this paper to confine myself to that aspect of organisation which relates strictly to learning activities.

Whatever the aim of education it must be remembered that the teacher should aim not at an ideal individual but at an ideal society. The reason is obvious. We cannot lay down a definite ideal for an individual because in that case we would disregard the " supply aspect " of the child and treat him as dead material which we could shape into a definite form. This would be against the very principle of efficient social organization. What is wanted is social efficiency through special proficiency of varied types achieved by individuals on the line of their special gift. That would emphasise variety and difference and not uniformity, because social efficiency is secured by co-operation of individuals of divergent characteristics. Thus the individuals are not to be turned out to one specified pattern in obedience to the principle of standardization of factory products. This suggests the main principle of the curriculum, *viz.*, width to start with followed by the experimental stages to determine

the direction of special aptitudes, and eventually final specialisation. The final specialisation is determined by what is called " cumulative specialisation " in the high school stages of secondary education. For example, when the fundamental elements of reading, writing and arithmetic have been acquired the teaching organisation should be so made as to discover specific tendencies which reveal themselves the age of 13 or 14 though at this stage these are not to be implicitly relied on because these do not yet take permanent directions. Hence while there should be opportunities for the special tendencies to have their play, the pupil's choice and interests are also to be controlled, because the immature mind may not yet make a sound choice. To enable special powers to assume permanent directions the following arrangements about the pursuits of children are recommended:

English, Vernacular, Arithmetic, History (mainly historical stories) and Geography (specially to acquaint children with the broad ideas of various races of mankind and countries), Hygiene, Essentials of Animal and Plant life, Drawing and Manual work, and Sports and Games—these should be compulsory subjects of study from class III to VI of High schools. From class VII to X Mathematics, History and Geography should be so grouped as to enable children to devote proportionately more time to a subject or subjects according to their special tendency. This may be effected by having two courses, *viz.*, elementary and proficiency, in respect of each of these subjects. The maximum that should be made available for an elementary course is 3 periods a week, and each pupil must select at least one subject from those of the group for an efficiency course. One of the classical language is a compulsory subject for class VII. The difference between the elementary and efficiency courses consists in emphasising the very broad and utilitarian points in the elementary course and a detailed study of the points included in the proficiency course. This is a preparatory step to the

selection of optional subjects for the Matriculation Examination and this selection should serve as a guide for future specialisation in the intermediate stage. To effect this principle we must start with the class as writ because at the beginning the idea is the acquisition of fundamentals in respect of every individual irrespective of the difference in mental capacity. Later on the subject is the discovery of special capacities. Therefore there ought to be suitable organizations for that purpose.

Classification of scholars for education is a necessity because in every sphere of activity we should combine efficiency with economy. Further, even from the point of view of teaching efficiency, class system should not be altogether tabooed. Even where we have got to make use of *plus* deviations to discover and encourage special gifts we should be well advised to adhere to class organization. Hence the value of the principle of classification inspite of the fact that children vary very considerably even in a group of supposedly homogene us group of pupils for class instruction. There is further the factor of correlation of mental capacities in respect of school subjects. But for this, class system would be unworkable. The correlation of mental capacities implies that pupils who are particularly brilliant in one subject are brilliant in others of the same group. Similarly, one who is mediocre in one subject is never brilliant in others, nor bad, and so on.

It has been pointed out that society is the ideal. Individual efficiency is achieved through influence of mind upon mind, that is, in society. It would be as unpractical to treat individuals separately as it would be undesirable. Hence, at least for organization, if not for learning, we must have class. But, in treating the class, individuals must not be forgotten. There must be provision for individualistic treatment in class organization. We are thus faced with the problem of individualisation in education.

"The school is a social group, and the class is a smaller

social group within the larger. Human life is very largely social life. And the school has a most valuable function to perform in affording a training ground for children to prepare for larger social demands and opportunities. We want young people to realise that there should be no conflict at bottom between individual interests and social interests. One of the services of the class is to inculcate that idea. At the same time, the social group should be a ministrant to the individual, and neither a class nor any other group is doing its best if it hampers individual development. The centre of education is not an institution nor an organisation, but personality." Thus, really speaking, class is for the child, and not the child for it.

Prof. Adams has pointed out that one of the most notable features of present-day education is the reaction against class teaching. Dr. Montessori is one of the earliest pioneers in a revolt against the older class instruction. This organisation is perhaps responsible for the impression that the knell of class-teaching has been rung. But even Dr. Montessori does not absolutely recommend the abolition of the class. At least for organisation, the class must be retained. The only point for a practical teacher to note is whether the class is contributing sufficiently and efficiently to the development of the child and NOT whether the child is keeping pace with the class. Other methods or organisations that have followed in the wake of that of Madame Montessori are the Gary system, the Howard Plan, the Project Method and the Dalton Plan. Some of these are merely modifications of the Dalton Plan and others are quite different. I propose to put the Dalton Plan last, not because it is the least important but because it is considered to be the most important, and that which comes last is remembered best. A brief survey of these methods will show that there is a growing tendency of shifting the emphasis to the child.

I. The Montessori Method.

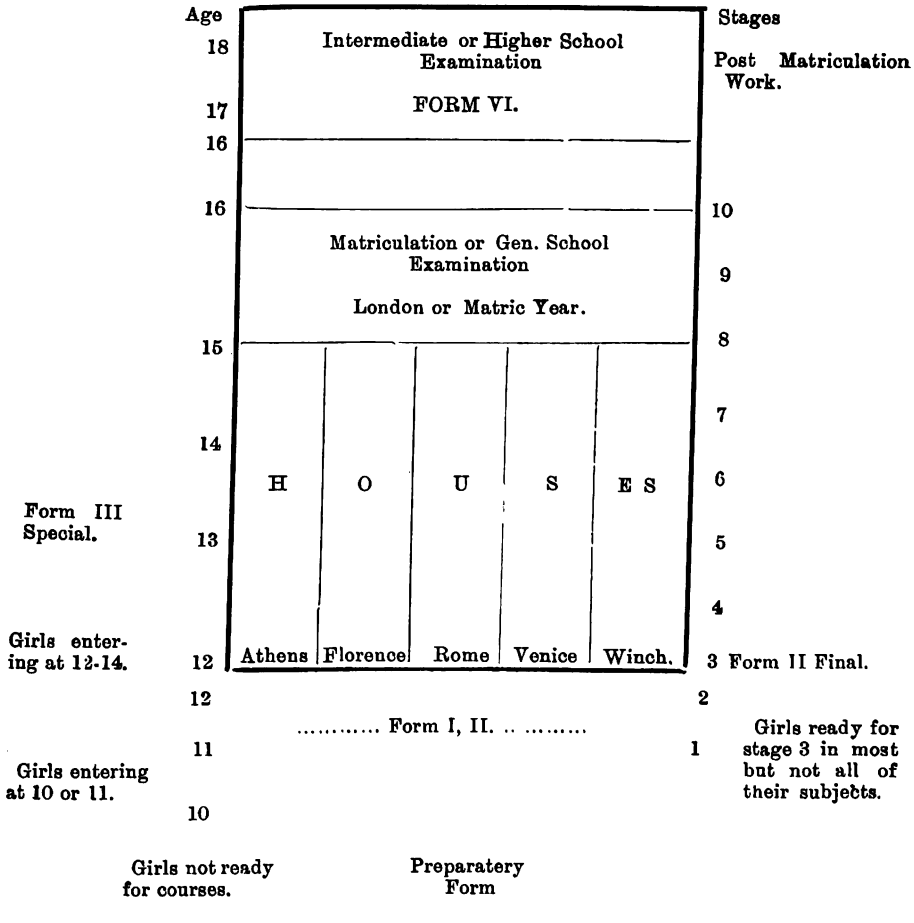
This method is suitable for little children and its essential principle is freedom, of which Rousseau is the pioneer. This freedom is however not the negation of discipline. Development of individuality which is the sole aim of the present-day movement implies freedom to chose and to act and to think for oneself in a social situation. All children do not need precisely the same treatment to develop. At home the different members of the family co-operate. This ought to be the right atmosphere in a school. The special device to encourage freedom in Montessori schools is the didactic apparatus.

II. The Howard Plan.

The originator of this plan is Mrs. M. O'Brien Harris, D.Sc. She, like Montessori, is also a woman of great originality and creative activity. The details of her plan are given in her book called *Towards Freedom* published by the University of London Press.

The main principle of O'Brien's scheme is auto-education. Digestion cannot be carried on by proxy. This applies with as much truth and force to education. O'Brien's school organisation is characterised by vertical instead of horizontal classification. The latter is into classes and the former into houses. In the House system members are of different ages so that the older may help the younger.

Thus when a girl has passed stage 7 of the curriculum and in the required stages of Art and Craft subjects she enters on her final year's work in the Houses—stages 8, 9 & 10 in the various subjects of the first school examination, she is then called a Londoner.



Mrs. O'Brien prefers a vertical classification into groups of mixed ages rather than the horizontal one into babies, three years olds, four years olds etc., suggestive of the racecourse. There is no competition for marks. Incentives are held out for development of ideals and for children to compare their progress with their ideals. The houses are called after certain European cities, *e.g.*, Florence (the Geography room) Athens (the Mathematics room), Winchester (the room for English and Latin), Venice, Rome etc.

Class teaching is an integral part of the work. At the same time the work is so arranged as to enable each individual girl to have her own time-table and to go at her own

rate. This is effected by arranging that the number of subjects taken by any one girl in any term is ordinarily less than the full number *viz.*, 7 she studies during the pre-matriculation period. The number taken in each term is 5. The class system requires the full number of subjects each term. There are nine terms to cover a three years' course. This system however has been tried only in a girls' school.

III. The Gary System.

This system takes its name from a city of this name near Chicago, and has been designed by Wirt, a man of practical genius in educational matters.

The most striking point of departure from the traditional system consists in the provision of accommodation for only half of the children the school actually teaches because according to his organisation only about half of the school time would be spent in the class-room. This economy in school house pleased the city fathers and they allowed Wirt the freedom he wanted to plan out his scheme. Economy in this direction enabled Wirt to make provision for many extras *e.g.*, playground, a swimming tank, laboratories, an art room, a conservatory, rooms for manual training, libraries and recreation rooms. The school day is made much longer than the ordinary school day, being seven hours daily for seven days to provide for all the changes, and to allow time for all the classes to get in their required work.

The commendable feature of the school is that it is an integral part of the city in that a spirit of co-operation marks the entire system. For example the analytical work is conducted in the school laboratory by the pupils under the teacher of chemistry who is also the town analyst. This gives the pupils the sense that they are actually engaged in the problems and tasks of life. Thus the situation is made real and practical. The school is a centre of community

activities ; the Gary schools are in that way schools in citizenship. The system also provides for a wider provision for choice on the part of the pupils. There is ample leisure for pupils to enjoy and also ample freedom because of the extension of the school day.

IV. The Project Method.

The principle on which the project method is based is that children should know clearly why they do what they do. It is no longer possible to run a class on the principle of coercion. The Project method really implies active co-operation which brings about real democray in education. The conduct of a school should be viewed as a co-operative enterprise. The project helps to make the child to feel that he is a part and an integral part of the group. The pupil is a member of a group and it is by participating actively in the activities of the group that he is made to feel an integral unity with the group life. This develops individuality in a social group in an atmosphere of freedom. There must be mutual give-and-take, a reciprocity of freedom and discipline. Only thus is a social organisation possible. Only thus can the school fulfil its mission in a democratic environment.

Excursion is an invaluable aid to project work. Division of knowledge or work into subjects is really artificial. When we story anything or do any work we study it from all points of view without minding its divisions into history, geography, drawing etc. A class for example, may start to make a survey of Dacca. This work does not merely mean the geography of Dacca, nor yet the history of Dacca but it implies all phases of knowledge, *viz.*, the history of Dacca, the geography of Dacca, the imports, the exports and industries, the local self-government. This is accomplished by excursion. Pupils go out, visit the Municipality, the Post

Office, the Water works, the Bank, the ancient ruins, the museum, the factories, the centres of different industries and so on. They have to observe, write accounts, draw maps, understand scale, tread a prismatic compass, read up the history and understand angles to study maps. Thus the subject is not history, nor geography nor yet drawing but everything. In fact, the study of Dacca cannot be accomplished unless students get the privilege of going out and studying and doing correlated things.

V. The Dalton Plan.

This plan is a continuation and modification of the Montessori method. This name is from the name of the place where the plan was first tried. Miss Helen Parkhurst is the originator of the plan. Both O'Brien and Parkhurst were students under Dr. Montessori, and both the American and the English women are indebted to the Italian educationalist for inspiration. Under this system the idea is to guide the pupils as they carry on their own work. The objective being the satisfaction of the need of self-development. The abolition of the time-table in the old sense and of class instruction, giving a greater amount of freedom for the child to determine the direction of study and to see larger opportunity for unrestricted self-development—these are outstanding features of the Dalton Programme. The Dalton work is divided into tasks which pupils take on a contract system, the idea being to deepen the sense of social responsibilty and to make the life of the school seem more a part and parcel of real life. These tasks are called assignments. These assignments take the place in the secondary stages of the didactic apparatus used in the Montessori system.

In the Dalton system a graph device is used to indicate the progress which the individual is making in each subject. The one outstanding advantage which the plan possesses is

that such pupil is permitted to make progress proportionate to his intelligence and energy.

The original scheme as recommended by Miss H. Parkhurst is known to all connected with education. Many people are also familiar with the scheme as modified by Lynch for West Green School, Tottenham. One should not be deceived by the peculiar name applied to the scheme. The main object of the scheme is to induce self-effort among children, develop a measure of individuality in an atmosphere of freedom to be enjoyed in a social group. So long as these principles are not violated the scheme may be modified and adapted to the peculiar conditions of different localities and yet continue to be called the Dalton Laboratory Plan.

The scheme has been tentatively tried in many places in Bengal and Assam and nowhere has this been an unqualified success. But these experiments are not without their value. They have revealed the weak points of the scheme, have put the merits to the severest test and suggested points of improvement calculated to lead to the success of the plan on detection of drawbacks discovered in course of the experiments.

The essential condition of the success of the plan seem to be a strong staff not afraid of work. Assignments for short periods *e.g.*, fortnights instead of months are the true key to the succes of the plan, and a teacher who has not the practical knowledge of the working of the scheme and who is not skilled in writing out assignments in proper form helps to bring discredit on the experiment. Checks and periodic tests are most essential and must be insisted on. These tests should be short and never elaborate—short-answer tests of the modern type. Oral tests to ascertain if the body has learned his lessons when the assignment is shown up ought never to be encouraged. This practice if encouraged is very likely to develop the type of boys given merely to note-taking instead of learning.

The time-table should be so drawn up and the assignments so prepared that teacher's work and pupil's work might be properly balanced, and teaching made subsidiary to learning. Pupils must be induced and encouraged to do as much learning as possible at their own rate. In other words, teachers have to be careful that the plan does not degenerate into the traditional lecturing method specially in the hands of the untrained teachers. This is prevented by definitely mentioning in the assignments the share of the work to be done by teachers and pupils separately. This cannot be effected by following the time-table as now prepared.

This is what is called the Jalpaiguri Dalton, because this modified plan has been introduced in the Jalpaiguri Zila school under the guidance of Mr. West, Principal, Teachers' Training College, Dacca. Here is a sample time table for the Jalpaiguri Dalton.

Days.	*Period and Subjects.*		
Monday.	1 Optional 2-3 English	4-5 Mathematics 6 Drawing & Manual	
Tuesday.	1 Ditto 2-3 Ditto	4 Bengali 5 History	6. Optional.
Wednesdny.	1 Mathematics 2-3 Ditto	4 Geography 5-6 Bengali	
Thursday.	1 Optional 2-3 Ditto	4 Geography 5-6 History	
Friday.	1 Mathematics 2-3 Ditto	4-5 Geography 6 Optional	
Saturday.	1-2 Mathematics	3 Bengali 4 Drawing & Manual	

Periods allotted to subjects : English 10. Bengali 5. History 3. Geography 3. Mathematics 6. Optional 5. Drawing & manual 2.

HERE IS A SAMPLE ASSIGNMENT FOR THE ABOVE TIME-TABLE.

History.

Tuesday: 1 period. Thursday : 2 periods.
(Two weeks, *i.e.*, 6 periods)
Topic: The beginning of Mahomedan rule in India.

FIRST WEEK

Tuesday:—Talk by teacher 45 minutes (1 period). Teacher talks on the following points (Name the points), tabulates main headings on the black-board. Boys note. Teacher inspects and checks. Pupils work individually.

Home work set: Read pp. 52-54: tabulate points under the main headings.

Thursday:—Free study (2 periods) Teacher puts on black-board the main points of study and boys are set on to read pp. 55-58. Teacher inspects home work while the pupils are at work. Boys are to draw a map showing Sultan Mahmud's campaign in India. The work to be finished at home.

SECOND WEEK

Tuesday:—(1 period) Home work collected. Teacher talks for 15 minutes drawing attention to the salient points of lesson. Boys are then set on to study the topics to which their attention has been drawn. Boys attempt a summary. Finish at home.

Thursday:—(2 periods) Teacher talks for 15 minutes reviewing the whole lesson. Boys revise, make queries, tabulate the points of the whole lesson. Finish at home.

This plan may be further modified and adapted to suit the conditions of backward high schools which are not in a position to try the Dalton Plan, even in the form recommended for Jalpaiguri.

For such schools an Unambitious Dalton Plan is recommended.

The main object of the Plan is to induce self-direction to make teaching subsidiary to learning and to secure a proper balance between the pupil's work and the teacher's work. Preparation for the final examination must not be forgotten. Do not emphasise the embellishments of the Plan as designed by the originator snch as Laboratories and Specialists. Only remember the main principles, and do not violate them when you adapt your scheme to the conditions of the school.

Have the ordinary time-table: only make provision for free study, thus—MONDAY: English: 2 Periods. TUESDAY: Bengali: 1 Period. WEDNESDAY: History 1 Period. THURSDAY: Geography: 1 Period. FRIDAY: Option: 1 Period. SATURDAY: Mathematics: 1 Period. Total 7 Periods, (or more, as preferred).

There must be Assignments for every subject, distributed over a fortnight. The Assignments will show what ground must be covered, what points specially studied, and what questions prepared against the monthly test. These assignments should be posted on the Notice Board for pupils to copy. The main object of the free study periods is preparation for the coming lessons or tests. The pupils mainly do written work at their own rate during the free periods and in that connexion make queries and have their difficulties explained. Bright students are encouraged to help the backward ones, with the permission of the supervising teacher. The teachers' business is to see that students really work. The written work done ought to be a proof of the profitable use of the free periods. At the end of every fortnight or even before, the written work should be shown up for inspection and initial, the teacher filling in the graph to measure the progress of individual pupils. Slow pupils may do a portion of the written work at home to finish it. The monthly tests are based on the Assignments done and these are marked.

The distribution of time to different subjects is roughly as below :—

English 8 periods. Vernacular 4 periods. Mathematics 5 periods. History 3 periods. Geography 2 periods. Optional 4 periods. Drawing 1 period. Total 27 *plus* 7 periods (free study).

The original Dalton Plan modified just to suit local conditions may be seen in the Hindu School, Calcutta, and in the Armenitola School, Dacca, also in various schools notably in the Rajshahi Division.

Here is a sample time-table for an advanced type of school working the Dalton Plan though modified.

Days	1.	2.3.4.	5.	6.
Monday	Formal Lesson. English	Dalton Work in English, Mathematics, Hist. & Geog.	Optional	Vernacular
Tues.	Formal Lesson. Geography		Ditto	Ditto
Wed.	Formal Lesson. Mathematics		Ditto	Ditto
Thu.	Formal Lesson. History		Ditto	Ditto
Fri.	Formal Lesson. English		Ditte	Ditto
	1-2	3	4	
Sat.	Dalton Work	Optional	Drawing	

These are some of the teaching organisations now in use in different parts of the world. It is never suggested that experiments irrespective of their suitability should be imposed on unwilling teachers, and even the genuine researcher must be kept within limits. But, experiments, it must be remembered, are not without value even if they fail, because they open out fresh lines of activity towards ensuring success. Moreover experiments keep teachers fresh and prevent them from getting into a rut by doing the same thing in the same

way from year to year. The true object of experiment is to discover the practicable way of achieving the desired result.

If you accept a principle adapt the method to realise it. If you fail try a new method which may achieve the same end provided you stick to the principle. Do not abandon the principle because a method tried has failed to achieve the desired object. If one method has failed another may succeed if you keep on trying.

Notes and Abstracts

American Journal of Psychology, October 1926

An experimental investigation of the determinants of apparent visual movement : by H. R. DeSilva.

The experiments reported here were performed with a modified form of Dodge Taschistoscope ; the stimuli employed consisted of a radial arrangement, a diametral arrangement and a pictorial arrangement. The author agrees generally with the conclusions of the Gestalt school. The influence of the subjective factors, such as attitude, attention, etc., is specially noticed.

Mescal visions and Eidetic vision : by Heinrich Kluver.

The author took the heroic measure of experimenting upon himself on the effect of mescal buttons (peyote). The paper presents an interesting description of the images occasioned by the drug.

Gestalt Psychology and Motor Psychology : by M. F. Washburn.

Professor Washburn agrees with the Gestalt school that "the total conscious state is in no sense a mosaic, but a continuous blended whole." She thinks however that the 'configuration' may be explained as a function of motor-response. It is this factor that seems to form the essence of that 'thing character' which constitutes a configuration.

What is Empirical Psychology ? by Leonard Carmaichael.

The term Empirical Psychology is employed in three different senses :

(1) *Empirical Psychology* may signify a method of investigation that relies upon the data of observation and experiment. It is to be contrasted with *Rational Psychology* which investigates into the nature of mind.

(2) The term is employed (Warren, Klemm, Koffka) to describe a system of Psychology "which holds that behaviour and experience are wholly developed in the ontogeny of the individual."

(3) Titchener uses the term in the sense of a "discipline concerned with the presentation of a reasoned account of the mind in use." In this sense it is "antithetical to an hypothetical Psychology which is purely descriptive." The paper considers the relative value of these three conceptions.

The effect of varying periods of adaptation on the flight of colours: *by Audrey M. Shuey.*

The paper presents the data of a series of experiments on the nature of after-images as determined by dark-adaptation of different duration. The author finds that when adaptation increases, (1) the number of images in which Y and R are experienced decreases, whereas the number of those in which B is experienced increases; (2) the number of the images that appear immediately, decreases. The fluctuations are more rapid and numerous when the period of adaptation is small.

Effect of serial position upon memorisation: *by E. S. Robinson & M. A. Brown.*

It is well known that the memory-value of a given element depends upon its position in the series. Primacy and finality determine the reproduction of syllables. The paper reviews the experimental work on this problem and reports the data of a new series of experiments. The earlier work shows that both primacy and finality facilitate memorisation. In the experiments under review, the effects of both primacy and finality are pronounced; the primacy effect extends over

several items in the first portion of the list, while the finality effect is much more limited.

The Biological conception of Libido:
by K. C. Mookerjee.

The psychic and the neural energies are differentiated forms of the biological energy, differing so far from each other in refinement that each is governed by its own laws and works in its own way. They constitute a functional unit as instanced by the phenomenon termed instinct by MacDougall. It is this neuropsychic energy which should be called Libido.

Other articles of interest in the volume are: The Mechanism of consciousness: Images by F. R. Bichowsky: The effect of suggestion on the Judgment of facial expression of emotion by E. Jarden and W. Feruberger, Synaesthesis: 'Pressury' cold by K. M. Dallenbach.

Calcutta University. N. N. SENGUPTA

The number of Articles of Psychological Interest published in the different languages. (1916-1925)

TABLE.

Date.	English.	German.	French.	Italian.	All Others.	Total.
1916	1682	526	126	83	2	2419
1917	2153	88	233	117	67	2658
1918	1126	218	67	157	18	1586
1919	1464	331	273	252	21	2341
1920	1769	765	195	202	39	2970
1921	1544	432	293	141	20	2430
1922	1837	1701	341	170	28	4077
1923	2015	1011	326	270	33	3655
1924	1772	1459	290	385	45	1039
1925	2082	1214	380	506	28	4210

Psychological Review

Vol. 33, No. 4. July, 1926.

Desire, choice and purpose from a Natural-Evolutionary Standpoint: *by Morris A. Copeland.*

Copeland insists that Teleological interpretations of human behaviour cannot substitute their Scientific accounts. The apparently purposive behaviour of man "is presumably to be understood by somehow reducing these terms, peculiarly appropriate to man, to a form in which they appear as special instances of animal and if possible of bodily behaviour in general." Accordingly he analyses cases where desire for an end, or choice or purpose seems to influence behaviours *i.e.*, where a consequent appears to determine its antecedents and shows how all of them can be accounted for in the simple Stimulus-response terms. When all is said, the question however, remains whether such scientific accounts of behaviour can wholly replace Teleological interpretations.

The Mental Age Concept: *by L. L. Thurstone.*

Thurstone points out the inconsistencies and ambiguities in the two current concepts of "mental age" which become especially prominent when we are dealing with an age group beyond that which has been experimentally determined to be the one at which the maximum mean test performance is attained. He suggests that the percentile standing of the child with reference to the norm for that chronological age should be used rather than the Intelligence Quotient.

Thinking as an Instinct: *by E. A. Heidbreder.*

The most convincingly written article is that of Heidbreder where he makes out a perfectly good case

for regarding "Thinking as an Instinct." After refuting the two common forms of modern criticisms directed against Rationality, those of Behaviourism on the one side, and of Psycho-analysis on the other, he shows how "Thought" and "Instinct" stand exactly in the same category as regards modes of operation, ends achieved, etc. Thinking is as much a natural process as any other instinctive activity and has the same "drive" as any other biological process. Thinking at its basis is a non-rational impulse ; it is native to man, it is continuous, as modern experiments on animals shows, with animal behaviour, and it has a pronounced emotional accompaniment. When all these characteristics are put together it would be readily seen that thinking conforms to the concept of instinct.

Is a synthesis of Psychological schools to be found in a personalistic Act-Psychology ? by Horace B. English.

The writer attempts to find a synthesis of the different psychological schools in 'a personalistic act psychology.' The task of psychology is to describe and explain personal experience. By experience is meant a personal act, a relating of self to object. This brings in at once philosophical discussions as to how really the object is to be interpreted. Alexander throws the 'act' overboard which English considers unjustifiable and a tactical blunder. "The object concerned in the psychic act is, for psychology, the real object, though taken from a personally limited viewpoint." But the act is determined not by the object only but also by Self. That brings in the "Self" psychology School. McDougall and Nunn's hormic psychology is expressed in terms of act. It is not difficult to bring Titchenerian Structuralism and Watsonian behaviourism under Act psychology, for both of them are studies of "*mental content.*" Gestalt also starts with perception. A configuration is a configuration only when it is brought into a relation to an act on some sense external to the pattern,

However much one may appreciate the writer's laudable object of synthetising the many prevailing schools of Psychology one cannot however pass off any loose jumbling together of different schools as a synthesis. McDougall's hormic principles which are psychophysical in nature are something quite different from psychic 'Acts' of which English speaks. The consciousness of a relation between self and the object need not necessarily be an act, while it is only by an act of force that Watsonian Behaviourism may be brought under Act Psychology.

There are three other articles on (1) What is Applied Psychology by Man Freyd in which the writer opines that the term Applied Psychology is a misnomer, (2) A preliminary personnel Study of Psychologists by Kipen, and (3) Concerning Art Standards by Farnsworth.

American Journal of Pschology, Vol. XXXVII. No. 3, July 1926.

Binaural vs. Monaural Sensibility of the Human Ear to Small Differences in Frequency: by Roscoe Conkling Young.

This is the first attempt at an exact quantitative determination of the difference in sensibility between the two ears to small differences in frequency, as also between one ear and two ears used together. Pitches higher than those used in ordinary speech and generally experimented upon were investigated and the number of persons examined were also higher than that examined by any previous worker. The results showed that while pitch sensibility was approximately the same for the right and the left ear under different conditions, that for both ears used together was appreciably higher in all cases. The experiments were carried out "by a method in which pitch, quality, intensity, regularity, of change from one note to the other and relative duration of the two notes could be carefully controlled."

Experience and Visual Perception: *by Charles. A. Dickinson.*

By simple experiments with a Tachistoscope of the pendulum disk type Dickinson demonstrates that there are three main levels in visual perception, each developing into the other, and he designates these as visual pattern, generic object, and specific object. The rising of the Gestalt school has put the problems of visual perception in the forefront just now and experiments such as Dickinson reports here are therefore welcome as valuable contributions towards their discussions.

An Experimental Study of Mental and Physical Functions in the Normal and Hypnotic States: Additional Results: *by Paul Campbell Young.*

The writer gives here further results of the experiments that he carried on with regard to the question of capability differentia of hypnosis from waking. By following a strict comparative method, which is a *sine qua non* of all such investigations, he does not find evidence for the common assumption that unusual powers accrue during hypnotic states. On the contrary, the results seem to show that "there is no noticeable difference between the normal and the hypnotic states in the ability of the normal persons in the fields of sensation, perception, fine discrimination, present memory (learning and retention), or physical work which does not involve fatigue." The writer's conclusion about the nature of hypnosis as "a state in which a person *will do*, in a *bona fide* manner, possessed of conviction, what he *will not do* in waking life for lack of such conviction" does not, however, carry us very far.

A Method for the experimental production of Emotions:
by H. F. Verwoerd.

One of the reasons generally attributed for our poor knowledge of the psychology of emotions is our inability of producing emotions in a laboratory for the purposes of experimental study. The method devised by Verwoerd shows, however, that this is not an insurmountable difficutly and emotions as natural as any in our daily lives, can be produced under the artificial conditions of the laboratory. Its very simplicity and its efficacy in producing such varied emotions as satisfaction, disappointment, regret, exaltation, delight, fear, shame, embarrasment, malicious joy, anger, vexation, etc., make the method highly commendable and we hope extensive use of it will be made in psychological laboratories.

The Criteria of Confidence:
by Frederick Hansen Lund.

Lund determines the criteria of confidence by experimenting on the recognition of nonsense syllables. He asked his subjects to report in each case the degree of confidence with which they recognised, the degrees being arranged in the order o (don't know), 1 (think so), 2 (fairly certain), and 3 (quite certain).

The Mechanism of Consciousness: *The Percept Arc*:
by F. Russel Bichowsky.

Bichowsky has already given us the Pre-sensation arc. He now finds that the characteristics of the "Background consciousness" of the Gestalt school are identical with those of the presentation arc, and his general theory of the "Figure consciousness" is that it is due to the activity of a higher arc superimposed on that of a lower.

The Tactual Perception of Form:
by M. J. Zigler and K. M. Northup.

The experimentors report that tactual form is not so definitely and unfailingly apprehended as tactual pressure when vision is excluded and the member kept passive during stimulation. They found that a dimension of at least 12 to 15 mm. is necessary to produce a tactual impression of determinate shape when the middle of the forearm is stimulated.

The Place of Ocular Movements in Stroboscopic Perception:
by Glenn. D. Higginson.

Higginson's plea is that the assumption of slight ocular shifts as a condition for the apprehension of apparent motion introduces a common element of unity by means of which a fairly large number of observed facts can be bound together. Many cases of apparent movement are then cited which can be satisfactorily explained by that principle.

L. T. Morgan reports on some characteristics of the work-curve with short working units. The results of Joseph L. Holme's experiments are negative as regards the question of the Reaction time being a function of Wave-lengths. Useful information is given by H. S. Liddel in his description of the laboratory of the Cornell University for the study of conditioned motor reflexes. Some minor studies are reported from the psychological laboratories of Nebraska, Clark and Antioch College.

Calcutta University. S. C. MITRA

Peychological Review

Vol. 32, No. 5.

The Definition of Judgment: *by H. L. Hollingworth.*

The author here seeks to present a satisfactory phenomenological indication of the events, experiences or processes which

the term "judgment" denotes. Speaking generally, there are two groups of doctrines regarding the definition of "judgment. The first group of definitions fall under the redintegration formula, as description of thinking in general in which the essential feature is the phenomena of meaning and the term 'judgment' does not relate to any special psychological experience. The second group holds that it is not merely the awareness of aggregate idea, and the vividness or effectiveness of some of its parts, or merely the thought of the relation between two items, but it is to be differentiated from other mental processes on the basis of confidence or belief.

The author shows that the second group of doctrines fails to give a precise and adequate definition of judgment, as confidence is no exclusive mark of it. Belief, Feeling, Guessing can be distinguished on the basis of 'degree of confidence'. Again the first group of definitions merely describes the characteristics of all thinking, namely, redintegrative sequence. Thus it is "not merely a name for the process of expressing or indicating a verdict, nor it is merely a particular feeling, or a peculiar yes—no consciousness. Nor is it an analysis of an obscure aggregate idea, nor a synthesis of two images, nor an articulation reflex. It is a process, a characteristic procession of events wherein there is involved the indication of one relation, not through its direct perception and report or naming but on the ground of the perception of a second relation instead."

Psychology of Pleasantness : by Christisan A. Ruckmiet.

After detailing on the variety of theories and opinions regarding affective processes and emotional life of man, and the difficulties that beset a final study of the affective consciousness the writer raises the following questions for solution:

(1) Are the affective experiences opposites of a single quality?

(2) Are they the limits of a unidimensional system within uncounted qualities between the extremes?

(3) Are they members of different systems?

The writer apparently has a behaviouristic bias and thinks that the physical and chemical procedure would be a better method of studying pleasantness and unpleasantness. He suggests that—(1) the opposition between these qualities is logical and not psychological, (2) the two qualities occur with unequal frequency both in every day life and in Laboratory Experimentation, (3) in terms of response there appear to be (*a*) no true opposite movements for pleasantness and unpleasantness nor (*b*) definitely correlated neural centres.

Feni College, Bengal. N. DASGUPTA

Report of the Second Annual Congress of the Indian Psychological Association

The second congress of the Indian Psychological Association met at Lahore on January, 5 under the presidency of Dr. N. N. Sengupta, M. ., Ph.D. The following office-bearers were elected :

President :

Lieut.-Col. Owen Berkeley-Hill.

Secretaries :

Mr. Gopeswar Pal (Elected by the Congress).
Mr. G. J. Das (Nominated by the President).

Executive Council :

Dr. C. H. Rice, Lahore.
Dr. N. N. Sengupta, Calcutta.

Editors of the Journal :

Lieut.-Col. Berkeley-Hill, Ranchi.
Mr. Haridas Bhattacharyya, Dacca University.
Dr. N. N. Sengupta, Calcutta University.
Prof. G. C. Chatterjee, Government College, Lahore.
Dr. S. C. Mitra, Calcutta University.

Council to the Journal :

Principal Michael West, Dacca.
Dr. G. S. Bose, Calcutta.

The membership fee for the Association was fixed at Rupees five inclusive of the subscription for the Indian Journal of Psychology.

Indian Science Congress

Report of the meeting of the Section of Psychology.

The Section of Psychology of the fourteenth Session of the Indian Science Congress met at Lahore on January 4, 5 and 6 under the presidency of Lieut.-Col. Owen Berkeley-Hill, M.D., I.M.S. The Universities of Calcutta, Dacca, Patna, Punjab and the Mental Hospitals of Bangalore and Ranchi were represented by delegates. The following papers were presented:—

1. A dream of an ascetic disciple by S. L. Sarkar, Noakhali.
2. On the love of music by T. H. Thomas, London.
3. Studies in Psychodynamics, Applications in Criminal Law by S. Sankara Menon, Trivandrum.
4. Echoes of a psychology of dreams in Upanishads by R. N. Sarma, Madras.
5. The place of consciousness in Mental life by P. B. Adhikari, Benares.
6. The Behaviourist Stand-point by K. S. Ghose, Hazaribagh.
7. Interpretation of insane conduct by Frank Noronha, Bangalore.
8. Inferiority Complex by H. D. Bhattacharyya, Dacca.
9. The combination of speed and quality in Bengali handwriting by J. C. Dutt and D. Sarkar, Dacca.
10. The choice of future profession of 1013 Bengali boys by S. K. Banerjee and H. C. Mukherjee, Dacca.
11. The Superstitions of Bengali teachers by A. Quari, Dacca.
12. The effect of knowledge of the purpose in the marking of compositions by A. K. Dutt, Dacca.

13. The reliability of essay marks by A. K. Dutt, Dacca.
14. Psychology and the School text-book by Michael West, Dacca.
15. Error in the ages of Bengali boys by A. Quari, Dacca.
16. Forgetting and Amnesia by J. K. Sarkar, Muzaffarpur.
17. Some factors in the psychology of advertisement by S. C. Sinha, Calcutta.
18. Vocabulary study of two children, 3 years and 4 years old by G. Pal, Calcutta.
19. Perception of forms in indirect vision by S. C. Mitra, Calcutta.
20. Monocular perception of distance by S. K. Bose, Calcutta.
21. A suggestion of a new method for the demonstration of Weber's law in the field of visual brightness by H. P. Maity, Calcutta.
22. The influence of musical notes upon tremors by M. Samanta, Calcutta.
23. A study in the increase of subjective brightness in a circumscribed field by M. N. Banerjee, Calcutta.
24. On Gestalt-Theory by N. N. Sengupta, Calcutta.
25. Intelligence tests for College freshmen by G. C. Chatterjee, Lahore.
26. The comparative value of some single tests as measures of general intelligence by M. Aslam, Lahore.
27. Retention by visual and by kinaesthitic presentation by M. Aslam, Lahore.
28. McDougall's Theory of laughter at the ludicrous by R. R. Kumar, Lahore.
29. Mysticism and Psychology—an exposition of a psychological approach to the problem of the

truth of Mysticism by W. M. Thomas, Jr., Lahore.

30. International group mental tests by Stuart C. Dodd.
31. Psycho-galvanic and Psycho-circulatory reflexes of Sense-stimulation by D. N. Sen, Patna.
32. Space limen in relation to the axis of rotation in the right arm by K. C. Mukherjee, Dacca.